ANALYSIS of the Effects of Marine Stewardship Council Fishery Certification on the Conservation of Seabirds

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EXECUTIVE SUMMARY AND RECOMMENDATIONS

Under a grant from the Walton Family Foundation, American Bird Conservancy (ABC), reviewed and analyzed the Marine Stewardship Council's (MSC) fishery certification process, with special regard to seabird bycatch and seabird mortality issues. This report presents the results of the analysis, and evaluates strengths and weaknesses of the MSC process and its impact on seabird bycatch and mortality.

- The MSC certification criteria reasonably address seabird bycatch and food chain issues. Although the criteria do not explicitly mention seabirds, they do require evaluation of all bycatch, which does include seabirds. If properly evaluated, the criteria would cover all seabird bycatch issues.
- Seabird issues are addressed directly in MSC Principle 2.2 and 2.3 as bycatch, and 2.5 as part of the food chain.
- Seabird issues are addressed less directly (compliance and enforcement, research planning, and monitoring) in MSC Principle 3.2, although Principle 3.1 (policy and governance) can affect seabird issues indirectly.
- Gaps in information, regarding seabird bycatch, but also many others, could be made more apparent or resolved by using a more standardized assessment report format.
- An important part of the assessment process is external review and comment on the Public Draft Certification Reports. Commenters can bring expertise and perspective that the assessment team may not have. The minimum time now required for allowing comments is only one month, but should be extended to two months.
- 138 MSC fisheries with public reports (either certified or in-assessment) were reviewed by ABC with regard to seabird issues. 85% of these use medium or low risk gears.
- ABC found that conditions for certification or recommendations that could affect seabird issues were placed on 54% of the fisheries. A large majority of these (79%) relate to obtaining improved information on bycatch and Endangered, Threatened, and Protected (ETP) species interactions. Only 4% correspond to direct actions that would affect seabird bycatch.
- MSC certified fisheries appear generally to do well with regard to seabird bycatch, with very few exceptions, such as the New Zealand Commercial Hoki Fishery and British Columbia Sockeye Salmon Fisheries.
- About two-thirds of fisheries entering the pre-certification process drop out before entering the certification process. It is not known how many of the drop-outs are a result of seabird bycatch issues, although the proportion is probably small.
- There are some significant success stories of fisheries being improved for seabirds during the pre-certification assessment, such as the South Georgia Island Toothfish Fishery and South Africa Hake Trawl Fishery.

- Conditions placed on certified fisheries usually require filling in information gaps, usually on bycatch. These conditions do improve seabird conservation, although the improvements are often small and incremental.
- Too many fisheries are being certified without sufficient information about seabird bycatch.
- Seabird bycatch issues during certification assessment have caused failure of only one component of one fishery, the set gillnet component of the DFPO Denmark Eastern Baltic Cod Fishery.
- The MSC certification process has had effects on seabird conservation outside of the certified fisheries themselves, primarily in providing information that was used by non-certified fisheries.
- Comparison of several fishery certification schemes shows MSC certification to be the most complete and rigorous with regard to seabird bycatch issues.
- MSC certification could be strengthened by following the recommendations given in the next section.

RECOMMENDATIONS

- Do not allow fisheries to be certified as sustainable if there is an information gap, for example in bycatch, and there is a reasonable evidence that the fishery might not be sustainable on that issue.
- No report should ever be able to be written that doesn't mention "bird" or any other ETP species that occurs in the area.
- Establish standards for certification reports, with requirements to:
    - Require that all issues be addressed explicitly. This would require a more standardized report format, with headings for each issue, including one specifically for seabird bycatch. If no seabird bycatch is known, the section could read "none known," but this would make the information explicit. One improvement might also be to use a checklist of issues to be addressed similar to those used by Friend of the Sea.
    - List and describe all mitigation methods being used.
    - Give proportion of target species catch that is landed using each type of gear in use in the fishery.
    - List all species of ETP seabirds (as well as ETP sea mammals, sea turtles, or other marine life such as corals) that occur in the fishery area.
    - List all species of seabirds that are significant bycatch.
    - Require reporting of seabird bycatch and interactions in a standardized quantitative manner.
    - Standardize the language and format of reporting observer coverage, so that observer coverage can be readily ascertained.
- Increase the amount of time between release of the Public Comment Draft Report and the final Public Certification Report by at least one month, to a minimum of two months.

INTRODUCTION

Seabirds are among the most threatened groups of birds on Earth. Seventeen out of 22 species of albatross, for example, have now been flagged by scientists as Vulnerable, Endangered, or Critically Endangered (IUCN 2011). Because most seabirds live for decades and reproduce slowly, any adult mortality translates to population-level effects. At present, the leading cause of mortality for healthy adult seabirds is accidental death due to interactions with fisheries.

Although seabirds have always followed boats, gear innovations in the past decades have made the behavior particularly dangerous. Concern over seabird interactions with fisheries swelled in the 1990s with the recognition that large numbers of seabirds were being killed as bycatch during of seafood harvest. Public outcry and pressure from conservation organizations and governments over seabird mortality led to the widespread closure of high seas driftnet fisheries, and the corresponding increase in the use of longlines. Seabird bycatch is also a serious issue in longlining fisheries, with birds following fishing boats for free meals of chum or waste, then trying to take the bait as the line is set, becoming hooked, and drowned. Increased attention to longlining and seabirds in general has inspired studies of seabird bycatch with other gear types, and more is now known about interactions with gillnets, seine, and trawl fisheries as well (see citations in American Bird Conservancy 2011).

Meanwhile, global demand for seafood has increased significantly. Although marine capture fisheries peaked in the late 1980s, the per capita consumption of fish has nearly doubled since the 1960s. The average US consumer ate almost 7% more seafood in 2010 than ten years earlier in 2001 (National Marine Fisheries Service, 2011). Over the same time period, imports of seafood increased by 22%, with about 60% of seafood consumed in the US coming from overseas (National Marine Fisheries Service 2011).

Seabirds may be killed during the process of seafood harvest in several different ways. In fisheries using hooks, such as longlines, birds are hooked and killed when the lines are near the surface of the water and have bait or small fish the birds wish to take. This most often occurs during setting of the lines, as the line reels off the back of the boat, but may occur on hauling as well or at other times if the line is sufficiently close to the surface that it can be reached, for example, by diving birds. Other hook fisheries, such as those using jigs, trolling, or handlines, usually have much lower rates of seabird bycatch, because of the continuous human attendance these gears require during fishing. Net fisheries, such as those using gillnets or trammel nets, often catch diving seabirds, which become entangled and drown. Because some seabirds can dive below 50 m depth, these nets can kill seabirds in any but the deepest sets. Trawl or seine fisheries usually pose less risk to seabirds than hooks or nets. In trawls, most birds are injured by striking the trawl warps or sonde cables during trawling, as the birds crowd around the stern of the trawler to obtain food items brought up by propeller wash or offal being discharged. Warp strikes frequently do not cause injury, but especially in larger seabirds, can cause broken bones or internal injuries that lead to later death of the bird. Some birds are also killed during the hauling of seines and trawls, when seabirds try to steal the fish within the net and become entangled. The birds may then be killed by the hauling machinery or crushed as the net is hauled on board, although many seabirds caught this way are released alive. Although generally posing a low risk to seabirds, fishery gear such as pots, traps, or creels, when set in shallow waters, may

kill diving seabirds. The birds may enter or partially enter the pot, become entangled, and drown. Cultivated and farmed fisheries rarely pose much of a risk to seabirds.

Fortunately, there is a suite of methods that reduce the risk posed to seabirds. In some cases these can also prevent nuisance and bait loss for fishermen. Foremost is the use of avoidance gear, which is especially well-developed for longline fisheries (which also pose the greatest risk to high-priority seabirds such as albatrosses). Bird-scaring lines, such as tori or streamer lines used to frighten birds away from danger areas, are among the most effective known seabird bycatch avoidance measure for longline fisheries. Making the lines sink more quickly by using any of several weighting or setting systems also reduces bycatch, because hooks sink quickly and the further the hooks are below the surface the less accessible they are even to diving birds. Management of chumming and disposal of fish waste (offal) can also have an important influence on the likelihood of bird interactions. Proper management of offal discharge, for example, avoiding bait setting periods, can help to reduce bycatch. Finally, the location and timing of setting the lines has an impact on seabird risk. Operations near breeding colonies are particularly dangerous to birds, and night setting or fishing only in the non-breeding season can very effectively reduce bycatch of birds. With these solutions in hand, the problem becomes primarily one of motivation and having the resources necessary (which may be fairly minor) to employ them.

Managing the common resource of the world's fisheries has become a high-stakes international field, with many vested interests. It is a highly politicized problem, given that many nations compete for the shared fisheries resources. Deciding how to share these resources sometimes leads to political tensions which indirectly affect attempts to protect seabirds. Partially in response to frustration with poor progress in international regulations, consumer-based approaches blossomed in the late 1990s, with the Marine Stewardship Council (MSC) leading the way in market-based approaches. In the last six years, the Marine Stewardship Council has grown considerably, from certifying six fisheries in 2004 to 114 currently certified, with another 104 at various stages in the evaluation process or withdrawn or not certified.

Market incentive methods can be an effective way of motivating fishermen. In fisheries both at home and abroad, seafood certification plays a key role in offering a carrot approach instead of a stick. Domestic US fisheries are already under tremendous pressure from foreign competition and declining stocks. The fishermen feel beleaguered by regulations, and end up resenting the regulatory structures, which make slow progress without industry support. Market-based incentives, on the other hand, change the dynamic and offer an avenue for progress.

Supporting progress in the private sector has a chance to offer rapid, significant conservation returns. For example, voluntary action by a single large fishery could affect many vessels. ABC's long experience with fishermen has taught us that they are willing to reduce seabird bycatch, which they find to be a nuisance, and even an economic loss, if they have appropriate and inexpensive mitigation techniques at their disposal

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OBJECTIVES

The goal of this report is to evaluate the benefits of the MSC certification process for seabird conservation. Specifically, this report will answer the questions:

1. Do the criteria for certification used by the MSC adequately address seabird conservation for the certified fisheries?
2. Does the MSC certification process have a demonstrated positive impact in reducing seabird bycatch?
3. How could the MSC process be strengthened?
4. Does the certification process influence fisheries that are not in the MSC certification process?

ANALYSIS OF MSC CRITERIA

The MSC provides detailed explanation and guidance for the certification process and assessment on its web site under "Documents." The most useful of these documents is *Fisheries Assessment Methodology and Guidance to Certification Bodies Including Default Assessment Tree and Risk-Based Framework, Version 2.1, Release date: 1 May 2010* (Marine Stewardship Council 2010a), hereinafter referred to as the MSC Assessment Methodology. This document sets out all of the criteria, scoring system, assessment tree, and gives detailed guidance on what the criteria mean and how they should be interpreted. Other useful documents are *Guidance to the MSC Certification Requirements, Version 1.0* (Marine Stewardship Council 2011) and *MSC Fishery Standard: Principles and Criteria for Sustainable Fishing, Version 1.1* (Marine Stewardship Council 2010b).

MSC Criteria

The MSC criteria are organized into three Principles (see Table 1 in the MSC Assessment Methodology), one each pertaining to:

1. Target species
2. Ecosystem
3. Management system

Within each of these Principles are Performance Indicators, which refer to some subset of the Principle's scope. Under the MSC Fishery Assessment Methodology, scores are given on the Performance Indicators.

Table **1** shows a simplified version of the default assessment tree. Because, of course, the target species are always the seafood items being harvested, the effects of a fishery on seabirds are grouped under Principles 2 (Ecosystem) and 3 (Management system). Therefore, the Components and Progress Indicators (PIs) for Principle 1 have been collapsed in the table, and will not be treated in the discussion.

The MSC provides much greater detail about each of these categories in the MSC Assessment Methodology (for a good summary, see Table 1 in that document), and in other documents. The

MSC document "Guide to Principles, Criteria, Sub-criteria and Performance Indicators" also summarizes the principles and describes them in general terms.

In Table 1, the gray-shaded components and performance indicators are those which relate to seabirds and seabird conservation. Principle 1 does not relate to seabirds, because it is entirely directed to target species. Within Principle 2, seabirds may appear in the components dealing with bycatch in general, with bycatch of Endangered, Threatened, and Protected (ETP[1]) species, and the ecosystem function component. Within Principle 3, seabirds and their conservation might be addressed through any of several information-related Performance Indicators which relate to the needs for information of the management system and enforcement of the certification requirements, to planning and decision PIs, and to enforcement of any regulation related to seabird bycatch.

Most certification issues regarding seabirds are addressed in Performance Indicators 2.2, the general bycatch component, and in 2.3, the ETP species component. Performance Indicator 2.5, ecosystem functionality, often includes discussion of effects on seabirds caused by loss of food fish or other changes in the ecosystem, but because data are difficult to obtain on how these less-direct issues actually affect seabirds, usually specific recommendations are not made. In Principle 3, the lack of information on seabird populations or on bycatch of seabirds is often addressed in Performance Indicators 3.2.4 and 3.2.5. Seabirds may be discussed directly under other Performance Indicators, but less frequently.

The MSC certification criteria seem to be reasonable with regard to assuring sustainability of seabirds in regard to bycatch. Even though the criteria do not in general explicitly mention seabirds, neither do they generally explicitly mention sea turtles or marine mammals. Rather, the criteria do require evaluation of all bycatch, which does include seabirds. The criteria are written to be sufficiently general that they cover all types of bycatch and are sufficiently flexible that they will cover bycatch under all conditions of fisheries (different gears and fishing methods) and all conditions of bycatch (differing classes of bycatch organisms, differing levels of legal protection, and differing conditions of threat to the bycatch species). If interpreted appropriately and following the guidelines in the MSC Fishery Assessment Methodology, all MSC certified fisheries should take seabird bycatch fully into account and have no unsustainable effects on seabirds.

MSC Assessments

However, as with all evaluations of this type, MSC certification evaluations rely on expert opinion of the review panel. This leaves an opening for unintentional failure to consider properly the sustainability of any levels of seabird bycatch, if the experts chosen for the review panel are not sufficiently knowledgeable about seabirds and seabird bycatch issues in the fishery they are reviewing. Of course, this also leaves open the possibility of intentional failure, if a fishery or certifying body wishes to obscure an unsustainable effect of the fishery, and selectively chooses experts without the knowledge or experience to appropriately evaluate the fishery.

[1] MSC uses the terminology of "Endangered, Threatened, and Protected species," usually abbreviated "ETP." These are all non-target species, including seabirds, which receive some specific legal protection or mention in regulations. Species that do not have some specific ETP status are still considered in the assessment process, but only under the bycatch component of Principle 2.

Table 1. The following table is a summarized version of the organization of the principles and performance indicators, and is based on Figure 2 of the MSC Assessment Methodology. Components and Performance Indicators shaded in gray are those which might be affected by or have effect on seabird conservation, although others might have indirect effects.

Principle	Component	Performance Indicator	Explanation
Principle 1 (Target Species)			Directed only at target species; therefore not relevant to the issue of seabird bycatch.
Principle 2 (Ecosystem)	2.1 Retained species	2.1.1 Status	Directed only at retained species, that is, non-target fish or shellfish that may be caught, retained, and sold as a part of the fishery.
		2.1.2 Management	
		2.1.3 Information	
	2.2 Bycatch species	2.2.1 Status	Bycatch species may include threatened or non-threatened seabirds (as well as non-seabirds).
		2.2.2 Management	
		2.2.3 Information	
	2.3 ETP (Endangered, Threatened, and Protected) species	2.3.1 Status	Directed at ETP bycatch species, which may include seabirds or non-seabirds.
		2.3.2 Management	
		2.3.3 Information	
	2.4 Habitats	2.4.1 Status	This component relates to the seabed habitat, not to the water column or terrestrial habitats. Therefore, it does not relate to seabird conservation.
		2.4.2 Management	
		2.4.3 Information	
	2.5 Ecosystem	2.5.1 Status	Ecosystem must maintain natural functional relationships among species, as between seabirds and their food sources, and fishery should not lead to trophic or ecosystem state changes.
		2.5.2 Management	
		2.5.3 Information	
Principle 3 (Management system)	3.1 Governance and policy	3.1.1 Legal and/or customary framework	
		3.1.2 Consultation roles and responsibilities	
		3.1.3 Long term objectives	
		3.1.4 Incentives for sustainable fishing	
	3.2 Fishery-specific management	3.2.1 Fishery-specific objectives	
		3.2.2 Decision-making processes	Act in a timely and adaptive fashion using best available information and a precautionary approach.
		3.2.3 Compliance and enforcement	Ensure that effective procedures are in place to assure compliance with the certification requirements.
		3.2.4 Research plan	Incorporate a research plan that addresses the information needs of management of the fishery.
		3.2.5 Monitoring and evaluation	Assessments of the status of the fishery and its effects are conducted.

In fact, an MSC certification covers a great many factors in the fishery, from fish stock distributions to invertebrate bycatch to fishery economics to fishery governance. It would be a rare panel of four or five experts, no matter how well chosen to incorporate experts with a full range of fields of knowledge and expertise, that would be able to properly evaluate all the aspects of a fishery completely. Because some weaknesses in the evaluation will always exist, it becomes necessary to make those weaknesses clearly apparent to external reviewers and public commenters. It is here that MSC's commitment to transparency becomes significant. Because the certification process does produce a Public Draft Certification Report, it is possible for outside reviewers, not associated with the certifying body, the expert panel or its reviewers, or the fishery, to be able to review the certification report, to evaluate its strengths with regard to various aspects of sustainability. The outside reviewers can then make comments requesting the certifying body to fill in gaps that may exist in the consideration of any aspect, such as sustainability of seabird bycatch. For this procedure to work adequately, it is necessary for the Public Draft Certification Report to make clear the lacunae in its evaluation.

Changes to Aid in Identifying Information Gaps in MSC Reports

An example of a Public Certification Report that has a significant gap is that for the Canadian Offshore Striped Shrimp (*Pandalus montagui*) Trawl Fishery, certified in June 2011. This report contains no information on seabird bycatch, neither to say that seabird bycatch is a problem, to say it is sustainable, nor to say it does not exist. The report in fact does not contain the word "bird" in it anywhere, nor the names of any individual bird species. Seabirds are simply not mentioned in the report. Information from sources outside the certification report suggests that seabird bycatch or mortality is likely to be very low in the Canadian shrimp fishery, and is probably not an issue that would affect the certification of the fishery. The assessors from the certifying body may have determined that seabird mortality and bycatch is not an issue, but they did not address it in the report. Unfortunately, this is true for too many Public Certification Reports to MSC; there are numerous other examples, including the Scottish Pelagic Sustainability Group Ltd. (SPSG) Atlanto-Scandian Herring Fishery.

There are many other examples of information that is not presented in reports on fisheries. Some important omissions seen too frequently are:

- Tonnage or other measure of quantity of catch. In fisheries where more than one gear type is used, it would also be useful to see what proportion of the total catch is obtained by each gear type.
- Description of mitigation methods used, or if none are used, a statement making that explicit. Mitigation methods could include gear modifications or add-ons, offal, management, area or seasonal closings, time of day of setting, etc.
- What species of ETP species (of birds, sea mammals, sea turtles, fish, etc.) are present in the fishery area. In cases where bycatch is an issue, most reports do detail the species, but if the bycatch is not considered important, the (potential) species of ETP bycatch are often ignored.
- Omission of any discussion of issues that are not considered significant. The example above of omission of any discussion of seabirds in the shrimp trawl is an example. With

this omission, it is not clear to the reader if the issue was actually addressed or if there is a problem that is being ignored.

To solve the problem of identifying gaps in the certification reports requires only simple and small changes. MSC could require reports in a more fixed format than it receives at present. Each of the certification bodies has a general report format that it follows, and these report formats are similar between certification bodies. They are not identical, however, and there have been format changes through time. A fixed format would make the review process easier and clearer, and could make gaps apparent. Each report should, for example, have a heading and section on seabird interactions, mortality, and bycatch. (There should also be similar sections on sea mammals and sea turtles, as well, and probably for some other groups of marine organisms.) This section would probably fit best as a subsection of the discussion of issues in Principle 2.2. If seabird interactions with the fishery were known not to exist, the section could then specify that "no seabird interactions exist," and provide sources. This would make clear what had been considered and what had not. A more fixed and formulaic report format for all issues, not just seabird bycatch, would aid in identifying lacunae in other issues as well, and aid the MSC in its efforts to maintain transparency.

Observer data are also often problematic in assessment reports. Although many reports discuss observer programs, the information is often scattered and unorganized, and can be difficult to interpret. No standards for presenting observer information are used, and very often it is difficult to determine what the observer data show. It can be difficult to determine from the assessment reports:

- Whether observers are industry-supported, government-supported, or independent
- Whether the data given are for a specific fishery or rather were obtained for a similar fishery in the region
- How much of the fishing effort is observed
- How the observer data were obtained (by on-board observers, by observation of landings, or by video monitoring)
- What observer information is collected (whether it only covers the target species, or target and retained species, or bycatch of fish, or bycatch of marine mammals and turtles, or bycatch of seabirds)
- What type of information is collected (only bycatch mortalities, only bycatch brought on board, or including observed fatal or non-fatal interactions)
- What qualifications observers are required to have, such as knowledge in identification, data recording, and training
- Annual variation in the observer program, with regard to coverage and techniques

Requiring that these types of information be presented in a standardized format would make the assessment reports much more interpretable. The information could be presented in a standardized tabular format or in a section with specified subsections.

Assessment Treatment of Harvested Fish as Food Supply

Greenpeace (2009b) has criticized the lack of strong language in the MSC methodology to address problems that predator species (that is, seabirds that would normally feed on the fish

being harvested) might face as a result of loss of food sources resulting from fishing activities. Although changes in the food web are addressed in the MSC Fisheries Assessment Methodology in Component 2.5, in practice, few assessors are able to fully evaluate the impact of fish take on the predator species. This is largely a result of lack of understanding of the mechanics of the ecosystem / food web. Such systems are highly complex, and it is rarely clear that harvest of a particular fish or shellfish species will have an effect on seabirds' food sources. Depending on the system, the seabirds may be able to shift their diet to other species. In some cases, removal of large predator fish may actually allow the smaller fish or shellfish to increase, providing greater food supplies for seabirds.

The MSC criteria do require the assessors to consider and score the effects or potential effects of forage fish removal on predators such as seabirds. However, largely because of the complexity of the ecosystems and the unpredictability of the effects of harvesting fish from it, these evaluations are rarely adequate. It is difficult to determine how this problem could be resolved. There are few ecosystems anywhere, terrestrial or marine, for which ecologists have such a complete understanding as to be able to clearly determine what effect harvest of a prey species will have on predator species such as seabirds. Obtaining the information adequate to make this determination is probably far beyond the resources that any fishery would have. The best solution to this problem therefore is probably to leave the criteria as they are, rely on expert opinion and available information to make the initial assessment, and to carefully monitor the population status of the predator species such as seabirds to detect any changes that might result from their loss of food supplies.

Assessment Comment Period

The seven-stage process for assessment of a fishery appropriately breaks down the assessment steps and ensures in general that the appropriate stakeholders are involved in the process. The process however has one significant weakness: the minimum public comment period on the Public Draft Certification Report is only 30 days. Although it is necessary that the certification process move forward without being stalled in any one step—the assessment and certification can require many months to several years—it is also necessary for the assessment to receive input from outside the certifying body, the expert panel of evaluators, and the fishery stakeholders. Outside comment and review can provide important additional perspectives and knowledge to the process. As mentioned above, it is unlikely than any panel of four or five expert assessors will be able to adequately understand all possible aspects of a fishery's impacts. Outside reviewers and commenters can provide additional insight and point out potential flaws in the process. In addition, of course, outside reviewers can ensure that the assessment is of high quality.

However, the comment period on the public draft of only 30 days is a small target for outside reviewers. To be able to know when a fishery is coming up to the point of releasing a public draft report, and then being able to provide a thorough review of that report within the 30-day time frame would require essentially full-time commitment by a reviewer or reviewing organization to following a fishery certification assessment through its entire assessment period. The system of RSS feeds provided by MSC for fisheries in assessment is an invaluable tool for any person or organization wishing to follow the assessment process. This avoids the necessity of anyone

wishing to participate in the review of the public draft reports to frequently visit the MSC web site and search through for new items or activities.

REVIEW OF FISHERIES

Although the MSC Fisheries Assessment Methodology, as described above, provides an adequate framework for assessment of the sustainability of fisheries with regard to seabird bycatch, it is necessary still to determine whether those criteria are being applied and interpreted appropriately to assure that the outcome of the assessments is correct and valid with regard to seabird bycatch. To that end, I have reviewed all MSC assessments to evaluate how those assessments considered seabird bycatch and whether it was correctly taken into account.

Fisheries Review Methodology

The 138 fisheries for which there are MSC public documents available, that is, those that are currently certified or had reached at least Stage 5 of assessment as of 10 February 2012, were reviewed to determine their potential risk to seabirds. The documents used were all of those containing information, including:

- Public Certification Reports
- Public Draft Certification Reports (only available at Stage 5 of the assessment process)
- Surveillance Reports
- Variation Requests
- Decisions of Independent Adjudicators
- Any other documents pertaining to the fishery

Each of these 138 fisheries was then reviewed using the methodology described in "Methodology to Assess Fisheries for Risk to Seabirds" (American Bird Conservancy 2011). This methodology is briefly summarized below; for greater details refer to the full document.

The seabird risk assessment methodology first applies a coarse filter to fisheries depending on the gear type(s) used and presence of ETP seabirds or seabird concentrations. Of the 138 fisheries, 38 were judged by these two criteria to potentially pose a significant risk to seabirds. An additional 22 fisheries were selected for in-depth review because of uncertainty about the information available for them. The remaining 78 fisheries were considered low risk and not in need of further review. These 78 were often those using gear types that pose little risk to seabirds, such as tong collection of shellfish, handlines, or harpooning.

The 59 potentially risky fisheries for seabirds were then passed into a second, more detailed, intensive review. The more detailed review evaluates an additional five characteristics:

- Regulation and enforcement of the fishery
- Mitigation method used by the fishery
- Actual bycatch of seabirds
- Observation of the fishery; presence of independent observers
- Uncertainty of information

The review of each of the fisheries produces a short account on that fishery. These accounts are combined in the document "In-Depth Analyses of Seabird Bycatch in Individual Marine Stewardship Council Fisheries" (American Bird Conservancy 2012), along with a listing of the 78 fisheries that did not require the second-step, more in-depth analyses.

Fisheries Review Results

MSC Certifications Over Time

As of February 7, 2012, MSC had 218 fisheries that are or have been in assessment (114 certified, 93 in assessment, and 11 not certified or withdrawn). For the review of individual MSC fisheries already certified or in-assessment, I examined the 114 Public Certification Reports (for fisheries already certified) and 24 Public Comment Draft Reports (for fisheries still in assessment, all those for which the Public Comment Draft Reports were available), for a total of 138 fishery assessments reviewed. Note that for fisheries in assessment, the Public Comment Draft Report is not available until Stage 5 of the seven-stage certification process; therefore, those reports are for fisheries already well-advanced in the certification process.

The pace of MSC certifications has increased significantly in recent years. In 2011 a total of 30 fisheries were certified, and in 2010 a total of 36 were certified, about the same pace. This was significantly more than the 21 certified in 2009, and more than four times as many as certified in 2008 (9 fisheries), 2007 (8 fisheries), or 2006 (6 fisheries). This increase in number of certifications per year indicates a strong and growing interest in MSC certification.

There were few fisheries certified before 2006, and some of those have been re-certified recently, so they actually appear as re-certifications in 2010 or 2011. Nonetheless, note the heavy weighting to recent years. Although it can take two to three years for a fishery to pass through the assessment process, with the 88 that are already in assessment, 2011 and 2012 could be even bigger years.

Geographic Distribution of MSC Fisheries

Of the 218 fisheries that are or have been in assessment, the majority (113 fisheries) are from the northeastern Atlantic in the waters off Europe. Pacific fisheries account for about one quarter of the fisheries (53). The remaining areas (Arctic, Southern, and Indian oceans, the rest of the Atlantic, and inland lakes) account for the remaining quarter (52 fisheries). Only seven certified or in-assessment fisheries are from the Southern Ocean, an area with high numbers of albatross species, many of which are ETP.

Gear Types Used by MSC Fisheries

Most fisheries reviewed used more than one gear type; only the main gear type is considered here. The majority of the 207 fisheries with information on main gear type use medium-risk gear types as the main gear (113 of 207 fisheries, 55%; see Table **2**). Only about 15% of MSC fisheries use the highest risk gear types (Table **2**). Most of these high-risk fisheries must then modify their systems by using mitigation methods to be able to qualify for MSC certification.

The medium-risk and low-risk gears account for 80% of all MSC fisheries certified or in assessment.

Table 2. Number of fisheries using each gear type, by risk posed by that gear type. For fisheries that use more than one gear, only the main gear type is considered.

Risk without any mitigation	Gear Type	Number of fisheries	Total
High	Longline	16	31 (15%)
	Gillnet	15	
Medium	Trawl	97	113 (55%)
	Seine	16	
Low	Handline, jig, harpoon, cultivated, pot, trap, dredge, tongs, etc.	63	63 (30%)

Conditions and Recommendations Placed on MSC Fisheries

Conditions to certification are given to fisheries if they score between 60 and 80 on any Performance Indicator[2]. Recommendations may be given on an indicator regardless of score. Both conditions and recommendations may be applied to any one fishery.

All conditions must be rectified during the period of certification (up to five years, because certifications are only given for five years), although the condition may specify that the period for rectification is less. Recommendations carry no official weight; it is not necessary that the fishery comply. Therefore, recommendations do not have any specified time period for implementation. Recommendations are much less frequently given than are conditions.

Not all conditions or recommendations placed on a fishery that could address seabird bycatch are established to address seabird bycatch specifically; in fact, few are (see Table 3, below). In many cases, a condition or recommendation is placed on a fishery to "record all interactions with ETP species" or to "improve data collection on bycatch." Although these conditions or recommendations should therefore include seabirds as a part of bycatch, they would also include other species, such as marine mammals or sea turtles, or even fish or invertebrate bycatch. In some cases the recommendations are clearly aimed primarily at the non-seabird bycatch, but would address seabird bycatch as a by-product. All of these conditions or recommendations which could address seabird interactions or bycatch, whether targeted directly at seabirds or not, were included in the following analysis.

Of the 138 fisheries reviewed, 74 (54%) had one or more conditions or recommendations applied that could potentially regard seabird bycatch. Of these, 12 received only recommendation(s), and four received both a condition and a recommendation potentially regarding seabird bycatch.

[2] If a fishery scores below 60 on any indicator, it cannot be certified; if it scores between 80 and 100 no conditions are necessary for certification.

The conditions and recommendations placed on fisheries that could address seabird bycatch issues fall into a small set of categories (Table 3). In addition, two of these categories ("Improve data collection…" and "Research…") are aimed at producing improved information on bycatch and interactions. The large majority of conditions and recommendations here considered (71 of 90; 79%) fall into these two categories. One category ("Develop a bycatch manual…") could reduce losses of seabirds, if the fishermen used the manual and were able to release alive any seabirds that had been caught. Only one category ("Change gear or mitigation methods"), with three fisheries with conditions and two with recommendations (4% of conditions and recommendations), would have direct impact on reducing seabird bycatch.

Table 3. Number of fisheries on which conditions or recommendations were placed as a part of the certification process, by condition / recommendation type. The conditions or recommendations fall into only five main categories. Note that the numbers do not sum to 74 fisheries because some fisheries received more than one condition or recommendation.

Description	Condition	Recommendation
Improve data collection on bycatch. This category may include "increase observer coverage," "improve data collection," "develop log book protocols," etc., but always refers only to improved data collection, not specifically to use or analysis of those data (which is a management condition; see below).	50	9
Research on bycatch. In many cases this is to determine what the impact is of the fishery on the bycatch species, but may also include research on mitigation methods such as offal management.	12	
Develop a bycatch manual / code of conduct. This may include education programs on bycatch reduction, how-to manuals on dealing with bycatch as it is brought on board, and codes on how to deal with injured animals.	4	4
Fishery management changes. These may include requirements to incorporate a strategy to reduce bycatch, or incorporating adaptive management techniques in the fishery management, etc.	5	2
Change gear or mitigation methods.	3	1
Create reserve for birds to mitigate loss of food sources.		1

The four fisheries in the category "Change gear or mitigation methods" and the changes that were required or recommended are listed in Table 4.

Table 4. Details of the conditions and recommendations placed on fisheries requiring them to make changes to gear or mitigation (category in Table 3).

Fishery	Condition or Recommendation	Detail
British Columbia Pink Salmon Seine, Troll and Gillnet Fishery	Condition	Use gear and practices that minimize bycatch. (Not clear if this refers to birds or only bycatch fish.)
New Zealand Commercial Hoki Fishery	Condition	Design and implement an offal discharge system, and employ bird bycatch mitigation.
Argentina Hoki Fishery	Condition	Implement bird-scaring (tori) lines.
SSMO Shetland Inshore Brown and Velvet Crab, Lobster, and Scallop Fishery	Recommendation	Store pots open on land, to reduce capture of birds.

HOW ARE MSC FISHERIES ACTUALLY DOING WITH REGARD TO SEABIRD BYCATCH?

From the individual analyses of certified MSC fisheries and those in assessment, it appears that few have serious problems with seabird bycatch, problems that would suggest that the fishery should not have been certified. This arises partly from three effects:

- *Self-selection*: Fisheries that do have high bycatch issues are rarely submitted for MSC certification.
- *Pre-certification resolution*: Fisheries that have seabird bycatch problems resolve those problems in the pre-certification process.
- *Regulation*: Regulation and enforcement by governments and international agreements have reduced seabird bycatch, especially in developed-country fisheries.

These three effects are not mutually exclusive, and in fact for most fisheries that are MSC certified, some combination of the three effects has probably already been incorporated in the fishery's pre-certification and certification process.

Self-Selection

This is probably the single most important factor in determining why MSC fisheries have low seabird bycatch. Seabird bycatch has been a hot-button issue for more than 20 years, and probably all commercial fishermen in all industrial-level commercial fisheries are aware that it

is. As a result of public and NGO awareness of seabird bycatch issues, there has been significant governmental and public pressure on fisheries to reduce bycatch.

The MSC certification process is expensive for a fishery, which must hire consultants for the pre-certification review and the certification assessment itself, and potentially make changes to its fishing methods. Therefore, fishermen and fishing companies are unlikely to enter the MSC certification process unless they are reasonably confident that the fishery will in the end be certified.

These two factors, awareness of the issue of seabird bycatch and desire not to incur the costs but fail certification, therefore lead to a fairly rigorous process of self-selection by fisheries, with only those that think they will have little or no problem on the seabird bycatch front[3] willing to enter the process. This may include fishermen that think they can readily and for reasonable cost resolve any seabird bycatch issue that they have, those who have already resolved any problem, or those without any problem.

This self-selection process can be seen in several different ways. For example, MSC-certified fisheries have largely tended to come from the developed countries, either fishing in developed-country waters or with fishing companies based in developed countries, when fishing in Southern Ocean waters covered by the Convention for the Conservation of Antarctic Marine Living Resources (CCAMLR), for example. Fewer than 40 MSC fisheries are from countries outside Europe, the US and Canada, and New Zealand and Australia. All of these countries have fairly strong governmental structures that reduce seabird bycatch, all have strong NGO communities that apply pressure to the government to improve regulation and enforcement, and all have direct public pressure for reducing bycatch. Therefore, developed-country fisheries tend to be "cleaner" at the outset, and more likely to able to enter the certification process.

A second way self-selection can be seen is that only about 15% of MSC fisheries use high-risk gears. The large majority are using medium and low-risk gears. As with the country of origin, this indicates that it is primarily fisheries that have low seabird bycatch that are entering the certification process.

Pre-Certification Resolution

For fisheries that do have seabird bycatch issues, those issues may be addressed in the pre-certification process. Pre-certification reports are not made public; therefore it is difficult to determine how many fisheries enter the pre-certification process with seabird bycatch issues, and to determine whether those bycatch issues are resolved, or if the fishery simply drops out of the process and does not go into the certification assessment process (which is public). The latter would be another case of self-selection, with fisheries with a seabird bycatch problem simply choosing not to submit to the assessment and failing.

During the pre-certification process, some fisheries that begin with seabird bycatch issues may also resolve those issues. The impact of the pre-certification process has been analyzed recently

[3] Clearly, the fishers also self-select on other factors, not just seabird bycatch. However, seabird bycatch is one of the factors which the fishers may consider when deciding whether or not to submit to the certification process.

by Cambridge et al. (2011). These effects are discussed in detail in the section "Are seabird conservation issues addressed by fisheries during the pre-certification process?" below.

Regulation and Enforcement by Governments

In recent years, primarily as a result of pressure from NGOs and the public, and especially in developed countries, seabird bycatch issues have been significantly reduced in some fisheries through governmental action on national fisheries and through some international agreements such as CCAMLR. This process began in the early 1990s with recognition of seabird bycatch as an issue, and has been increasingly addressed. Some fisheries that have been forced by governments, whether willingly or not, to reduce their seabird bycatch have then been therefore able to submit to the MSC certification process. This may be indicated by the fact that the majority of MSC certifications through time have come since 2006, and a large majority since 2008. This suggests that most MSC certifications are of fisheries that were cleaned up five to ten years ago, thereby becoming eligible for MSC certification.

Exceptions

Although it appears that few MSC certified fisheries still have serious problems with seabird bycatch, there are exceptions, fisheries that have been certified as sustainable by MSC, but which arguably should not have been. Fortunately, these exceptions are few.

New Zealand Hoki

One particularly notable case is that of the New Zealand Commercial Hoki Fishery. This fishery was one of the early MSC certifications, with its original certification given in March 2001. The fishery was re-certified in November 2007 and has recently entered the process for its third certification.

Immediately after the hoki fishery was certified in 2001 the Royal Forest and Bird Protection Society of New Zealand (RFBPS) filed an objection with MSC to withdraw the certification. Adjudication allowed the certification to stand, but added a number of new conditions on the fishery, none of which regarded seabird bycatch. In October 2004, New Zealand officials supporting the National Plan of Action asked the hoki fishery to assess the extent of seabird warp strikes to improve knowledge of seabird bycatch. However, this had not been addressed by the time of recertification in 2007. With the re-certification in 2007, several conditions were placed on the fishery with regard to seabird bycatch. These included:

- Carry out a risk analysis for seabirds.
- Design and implement an offal discharge system.
- Develop a vessel auditing system to ensure that appropriate offal management is being used.
- Develop a research plan to gain understanding of fluctuations in impacted non-target species, effects of fishing on the ecosystem, and ecosystem management strategies. The research plan should include peer review.

During the re-certification period since 2007, it appears that most of these conditions have been met, and that the hoki fishery is not now killing a lot of seabirds. The fishery boats are using mitigation methods, such as bird-scaring lines and bafflers. It is now required that all boats use offal management systems that reduce threats to seabirds, and compliance is monitored by governmental authorities. At present, although the number of birds killed is not terribly high and perhaps is sustainable, this fishery is nonetheless an important one to continue to monitor and evaluate, because of the large number of threatened species of birds, especially albatrosses, that occur in the fishery area and can be caught as bycatch or killed through injuries such as warp strikes.

It is clear that the original assessment and 2001 certification of this fishery were troubled. It is fairly clear that the original assessment should not have recommended certification, as there were many issues that were not clearly sustainable, some relating to seabirds but many others not. This was an early test of MSC certification process. Presumably, MSC has learned from the difficulties brought up by the original assessment, and is not now allowing such certifications to proceed.

British Columbia Sockeye Salmon Fisheries

A second notable exception is the case of the British Columbia Commercial Sockeye Salmon Fisheries. These fisheries were certified for the first time in July 2010, with the time from initiation to certification being nine years, the longest MSC certification process so far. The majority of the delays were to address issues other than seabird bycatch.

Seabirds either in aggregate or as individual species are scarcely mentioned in the certification report. An outside review of the draft report made by representatives of a group of NGOs in August 2009 stated: “[T]he assessment fails to consider bycatch impacts of other species, particularly seabirds.” The certification report also stated that a review of seabird bycatch in Canadian fisheries had shown that salmon fishery observer coverage was very low and logbook reporting of seabird bycatch was voluntary, resulting in very low reporting. Reviewers also suggested that the bycatch of seabirds in Fraser River sockeye fisheries could be very high and significant for some species, but that seabird bycatch was never raised as a serious concern.

The fishery probably does not have a large effect on seabird populations. Most of the gears used are of low or very low risk to seabirds. Because much of the fishing is inshore or even in rivers, the seabirds affected are likely mostly gulls, and the gull species in the area are not threatened, so some losses to the fishery might be sustainable.

However, the fishery does use some high-risk gear (gillnets) and does some fishing offshore where other, more threatened seabirds occur. It does so with an almost complete lack of information. There is no significant observer program that might record seabird data. Log books and other reporting are voluntary, and compliance has therefore been low. More worrying, the assessment team placed no condition or recommendation on the fishery to improve its data collection.

This fishery therefore remains problematic with regard to seabird bycatch. Although seabird bycatch may be low, inadequate information, coupled with lack of any effort to obtain the

needed information, does not allow any level of confidence that the fishery is sustainable with regard to seabird conservation.

ARE SEABIRD CONSERVATION ISSUES ADDRESSED BY FISHERIES DURING THE PRE-CERTIFICATION PROCESS?

For a fishery, the first step towards MSC certification is called the pre-certification process. The pre-certification process is a much less formal review than a certification assessment, usually solely by the certifying body without an assessment team, to determine whether a fishery is likely to achieve certification with or without modifications. The objective is to make a rapid assessment of the likelihood that the fishery can be certified, and to identify weaknesses that would have to be addressed before certification. This avoids having to make the large investment in a complete certification and can assist a fishery in correcting weaknesses before the certification process begins, and therefore to avoid failing certification after having invested the usually significant sum of money required for certification. The MSC has a template for pre-certification procedures, and receives copies of the pre-certification report, although these reports remain confidential, unlike the certification reports. Therefore, it is not easy to analyze the results.

In the pre-certification process the certifying body may identify issues that the fishery will need to correct before applying for certification. These may be significant issues that require up to several years of effort to be addressed fully. In addition, during the pre-certification process some fisheries may be determined to not be certifiable at all ("Not recommended"), or not without changes that are prohibitive in cost and therefore preclude the value of certification. Almost two-thirds (65%; Cambridge et al. 2011) of fisheries drop out following the pre-certification process. This suggests therefore that the majority of improvement in seabird conservation is coming during the pre-certification process. Fisheries are "cleaned up" during pre-certification and require little improvement then during the certification assessment itself.

Cambridge et al. (2011) pointed out that in fact the scores for all Progress Indicators (not just those relating to seabird bycatch) in the pre-certification remained nearly the same in the certification process, showing that the issue the indicator addresses was already considered sustainable in pre-certification. Only 18% of the indicators made improvements from pre-certification to certification, and even most of these (13%) were already considered sustainable in the pre-certification. Only 5% of indicators improved from a non-sustainable level to sustainable between the pre-certification and certification.

On the other hand, the pre-certification process may not have a significant effect on seabird conservation on those fisheries that do drop out of the process following the pre-certification assessment. If a fishery does not enter the certification process, there is no further pressure on the fishery to solve its bycatch problems (at least not from the certification process).

Nonetheless, there are some significant successes for conservation of seabirds during the pre-certification. For example, the MSC web site states:

> *The South Georgia Patagonian Toothfish Fishery implemented a range of measures before the assessment took place. This included measures to reduce seabird by-catch, such as setting fishing lines at night and adding weights to lines to help them sink faster (and so avoid interactions with seabirds). Bycatch of albatross declined rapidly as a result, and was soon close to zero. Other measures introduced include an observer program on all vessels and halting transhipment of catches to secure traceability.*

Another fishery for which there are known gains for sustainability derived from the pre-certification process is the South Africa Hake Trawl Fishery, which established observer coverage as a result of the pre-certification assessment.

However, without further access to the confidential data in the pre-certification reports, it is difficult to fully evaluate how much the pre-certification process is improving conservation of seabirds.

ARE SEABIRD CONSERVATION ISSUES ADDRESSED BY FISHERIES DURING THE CERTIFICATION PROCESS AND CERTIFICATION PERIOD?

This question is related to the two previous questions. It is of interest for MSC itself, at least with regard to the larger picture of sustainability of fisheries, if not for seabirds specifically. As a result, MSC has commissioned its own analyses, the first published in 2006 (Agnew et al. 2006), and the second in August 2011 (Cambridge et al. 2011). The study by Agnew et al. (2006) analyzed ten fisheries certified up to 2005, whereas Cambridge et al. (2011) reviewed summary information for all 447 fisheries, including those that had been in pre-certification whether or not the fishery went on to enter full certification, and also reviewed detailed information on a sample of fisheries both in pre-certification and after certification had been granted. The results reported in these analyses are not specific to seabirds, but to all sustainability issues covered by MSC.

Agnew et al. (2006) concluded that all ten of the fisheries analyzed had some environmental gain as a result of the certification process. These gains, however, were not separated for seabirds in the report, so it is unclear if there was any improvement in conservation for seabirds.

Because the Agnew et al. (2006) analysis was conducted in 2005 and 2006 on fisheries that had been certified more than a year earlier, it covered some of the very first fisheries that were certified under the MSC, which was established in 1997. Therefore, these fisheries were assessed under criteria and procedures that were newly developed. The MSC has refined and standardized its procedures significantly since 2006, with a revised assessment procedure released in 2010 (Marine Stewardship Council 2010a). In addition, the late 1990s and early 2000s was a period when significant attention was being given to seabird bycatch issues by governments, NGOs, and researchers, with resulting improvements in bycatch avoidance, results that were not related to MSC certification. Therefore, the results of the Agnew et al. (2006) report seem not to be current nor related to the present state of fisheries and seabird bycatch. To evaluate whether seabird bycatch issues are being addressed by the MSC certification process in the present climate, where CCAMLR and the US and Canadian governments, for example, have already required

fisheries to employ mitigation techniques, would require a more up-to-date review of the confidential pre-certification reports. In fact, the conservation result described above for the South Georgia Patagonian toothfish longline fishery can only partially be attributed to the MSC certification, as part of that result came from reduction in illegal fishing and efforts by the South Georgia government and CCAMLR to reduce seabird bycatch. In this present report by ABC, however, the review of conditions and recommendations placed on fisheries as a part of the MSC certification does include recent, up-to-date information on the publicly-available effects of the MSC certification on seabird conservation.

Cambridge et al. (2011) interviewed stakeholders of a sample of MSC-certified fisheries. Of these stakeholders, 34% said the situation of the fishery in general (as opposed to specific seabird issues) had improved, as opposed to only 10% who said it had deteriorated. Bycatch and ETP species Performance Indicators were two of the top three the respondents said had improved most; these indicators could refer to seabird issues, although not necessarily. About half of respondents said that improvements were a result of the MSC certification, and said most of the changes resulted from new information or changes in management, that is, not from changes in gear type used or in mitigation methods used.

Do conditions placed on fisheries by MSC certification do anything for seabirds?

If a fishery receives a score from 60 to 80 on any Performance Indicator, a mandatory condition must be set on the certification, requiring rectification of the issue causing the low score before the end of the certification period of five years. (If any Performance Indicator receives a score less than 60, the fishery may not be MSC certified.) In addition, a written plan of action to rectify the issue and a timetable for completion of the actions are included in the certification. The fishery operators must agree to the plan of action and timetable for removal of the condition, and their signed agreement to comply is included in the certification. For seabird issues, most of the plans of action for rectification of conditions have timetables shorter than the permitted five years; many are to be rectified in only one to two years. Verification of the progress to meeting the condition is made during each of the annual surveillances required of all certified fisheries, and is recorded in the surveillance reports. Very few fisheries receive scores greater than 80 on all Performance Indicators, so almost all fisheries have several conditions applied to them.

In addition to these mandatory conditions, the certifying body may place non-mandatory recommendations on any issue in any Performance Indicator, regardless of the score. Recommendations are usually given by the assessment team because they would make a positive contribution to efforts to ensure the long-term sustainability of the fishery. Recommendations are also usually tracked in the annual surveillance reports, but because they are not mandatory, sometimes are not. Recommendations are less frequently included in certification reports than are conditions.

As mentioned above, about 54% fisheries have some condition of certification or recommendation that applies to seabirds, although in many cases, these are not directed solely at seabirds, but rather at bycatch species in general.

The large majority of these conditions relating in some way to seabirds are for Performance Indicators in Principle 2, and usually Components 2.2 (Bycatch species) and 2.3 (ETP species). More rarely, conditions are placed on a fishery as a result of an issue under Principle 3, and then usually in 3.2.4 (Research plan).

A large majority (79%) of the conditions or recommendations recorded had to do with improving information on seabird bycatch. These usually require improved observer coverage, improved collection of data by observers, or improved information on the seabirds that may be encountered. Most of these conditions or recommendations also have a requirement that if the improved information on seabird bycatch shows the bycatch to be unacceptably high, the fishery must then address the issue by implementing appropriate actions to reduce the bycatch. This can be seen for example in Condition 2 placed on the Norwegian North East Arctic Offshore Cod Hook and Line Fishery:

> *Condition 2: ETP Species. The [assessment] team discovered a lack of gear specific information relating to the interactions of ETP species within the fishery. This condition requests the development of a statistically rigorous monitoring programme relative to gear type. Appropriate measures should be designed and implemented where interactions are found to be unacceptable (within the time frame stated).”*

The certification for the Norwegian North Sea and Skagerrak Herring Trawl Fishery placed a similar condition but with even greater detail, requiring that the information be collected in the first three years of certification, and if mitigation methods are then determined to be required, they must be implemented and the issue resolved within five years of the initial certification.

This means that fisheries may be certified even though they may have serious bird bycatch issues, but for which there is not much information. The condition therefore leads to a two-step process: 1) obtain information on seabird bycatch, then 2) act on that information. This places the rectification of the problem, seabird bycatch, far into the future and after the fishery has been certified as sustainable. It would be more appropriate to address the information need before a fishery is certified, and if the seabird bycatch issue is indeed not serious, its rectification could be made as a condition. This would place the rectification of the problem as an immediate result of the certification, not as a second-step result.

In some cases, recommendations suggest going beyond what is required with regard to seabird bycatch. An example is Recommendation 2 for the Pelagic Freezer-Trawler Association Atlanto-Scandian Herring Pelagic Trawl Fishery certification, which recommends adoption of a strategy for managing effects on ETP species “that is above national and international requirements for protecting these species; and also adopt[ing] a strategy for gathering quantitative information about these species.”

In general, then, some conditions or recommendations placed on fisheries do have effects on improving seabird bycatch issues, even if only small and incremental. A larger problem seems to be what the types of conditions placed show: that too many fisheries are being certified without sufficient information about seabird bycatch. This is reflected in the fact that nearly 80% of conditions and recommendations refer to improvement in information collection.

One particularly notable feature is that larger fisheries (greater tonnage of catch, larger fishing area, more gear types) tend to be those which have less or inadequate information on seabird bycatch. An example is in the certification of the British Columbia Sockeye Salmon Fishery, where "salmon fishery observer coverage is very low and logbook reporting of seabird bycatch is voluntary (resulting in very low reporting)." That fishery was certified without any conditions or recommendations to rectify the problem. However, most other fisheries with similar gaps are certified with a condition requiring the fishery to collect more and improved quality of information.

Cambridge et al. (2011) showed that during the certification period (the five years following the issuance of the certificate), scores for only 12% of Performance Indicators in Principle 2, which is the one in which most seabird bycatch issues are addressed, showed improvement, although these may not be related to seabirds but rather to other bycatch species such as cetaceans, sea turtles, or other fish. The majority of the improvements in scores for ETP species actually showed up as improvement in information (78%), and only one indicator showed actual improvement in outcome score, and that in the ecosystem (Principle 2.5), which probably was not related to seabirds.

Does seabird bycatch affect the possibility of certification?

During the certification assessment period (following pre-certification, of course), there are no examples of an entire fishery failing certification as a result of seabird bycatch or mortality issues. There is however one example of one component or gear type used by a fishery that caused certification to fail as a result of seabird bycatch problems.

The DFPO Denmark Eastern Baltic Cod Fishery was certified in April 2011. At the initiation of the certification process DFPO had also included a set gillnet component of the fishery in the unit of certification. However, after the assessment was completed the certifying body determined that the set gillnet component did not meet MSC standards, due to issues with sea mammal and seabird bycatch, but trawl and longline components of the fishery were certified. The assessors determined that the set gillnet component did not meet Performance Indicators 2.3.1 and 2.3.2. Both of these Performance Indicators have to do with ETP species as bycatch.

The main reason for failing these two indicators was the number of harbor porpoises caught in set gillnets. However, a second and very important reason for the failure was the potential for seabird bycatch in the set gillnets. A study by Zydelis et al. (2009) indicated that as many as 100,000 to 200,000 diving seabirds (grebes, loons, ducks, alcids, and cormorants) were killed in the Baltic Sea and eastern North Sea by set gillnets. Although it is not clear that the DFPO fishermen using set gillnets were included in the fisheries studied by Zydelis et al. (2009), the information was sufficient that the assessment team was not able to score the seabird bycatch issue above 60 (below 60 is failing) for the DFPO set gillnet fishery. This appears to be a completely appropriate decision.

It is important to note that for the other two gear types in this fishery, demersal longline and otter trawl, no study similar to Zydelis et al. (2009) has been carried out. Therefore, the two certified

gear types were certified in the absence of solid information, and the one gear type (set gillnet) for which solid information was available failed certification.

A second issue regarding seabird issues is that many fisheries are being certified as sustainable with known seabird bycatch, but with inadequate information on the size and implications of that bycatch (discussed in the previous section). A significant number of fisheries are being certified with the condition that they obtain or improve information on seabird interactions and bycatch. In many of these cases it is not clear that the fishery is actually, at the time of certification, sustainable with regard to seabird bycatch. Although the conditions placed on the fisheries probably would over time, ensure that they are sustainable, fisheries could be certified that are not sustainable at the time they are certified, only because the information is not there. Conditions, in the MSC scheme, are to be placed on fisheries that are sustainable but can be improved. If the fishery is not sustainable, it is not supposed to be certified.

Therefore, MSC should not allow fisheries to be certified for which there is a reasonable suspicion of unsustainability, but for which information is not available. For seabird issues, an example is the British Columbia Sockeye Salmon Fisheries (page 23), in which potentially significant seabird bycatch and a lack of information on that bycatch was brought up by reviewers of the Draft Public Certification Report, but the fishery was certified anyway.

Does MSC Have Influence Outside Certified Fisheries?

Both Agnew et al. (2006) and Cambridge et al. (2011) showed that MSC certification produced effects outside the certified fisheries themselves. Of course, not all of the external effects are related to seabird issues, but some significant ones were.

Agnew et al. (2006) gave two specific cases, improvements in the South Africa hake trawl and in the South Georgia Patagonian toothfish trawl fisheries. In these cases, the gain that was useful to other fisheries was in information. In the case of the South Africa hake trawl, the increased observer coverage that was a result of the certification process provided information on other South African and regional fisheries. In the case of the South Georgia Patagonian toothfish trawl, information obtained on mitigation measures was useful to other fisheries in designing their own mitigation techniques. In South Africa, the government permitting process used the MSC certification results as the basis for setting its permit criteria for other similar but non-MSC-certified fisheries. Two of the permit criteria regarded seabird issues. One was that bird-scaring lines were to be used during trawling, and the other was that offal is not to be discarded during shooting of the trawl (Cambridge et al. 2011).

All of these cases indicate that MSC certification can have effects outside the certified fisheries themselves, although in most cases the impact is likely to be primarily in information.

COMPARISON OF CERTIFICATION SYSTEMS

Although the Marine Stewardship Council seafood certification program is clearly the largest, in number of fisheries certified and amount of seafood that is marketed from those fisheries, there are several other fishery/seafood certification programs. Accenture Development Partners (2009)

provides an in-depth comparison of the various fishery and seafood certification systems, although the study does not specifically address seabird issues. Greenpeace International has also assessed and compared several different fishery certification schemes, using their own assessment methodology (Hauselmann 2009), but it too does not address seabird issues directly. Therefore, in this section, a comparison will be made between other third-party certification programs and the MSC program (also a third-party certification program) with regards specifically to their treatment of seabird issues, to point out the differences, strengths, and weaknesses of each.

Friend of the Sea

The Friend of the Sea (FOTS) certification appears to be the second largest, after MSC. FOTS was established by the European director of Earth Island Institute's Dolphin-Safe Project, and seems to maintain significant links with the Dolphin-Safe Project, as several of its staff are also part of the Dolphin-safe Project. FOTS is based in Italy, but has offices in Australia, the UK, the USA, and Switzerland. Its certifications were established in 2006. The organization has two certifications, one for farmed and one for wild caught seafood. FOTS presently has more than 30 certified fisheries from around the world, although many are in New Zealand.

The FOTS certification procedure resembles that of the MSC, in having a pre-certification evaluation, an evaluation carried out by a certification body, and post-certification surveillance audits. However, FOTS does not provide any guidance to the assessments, beyond fairly brief (10 page) checklists. Most of the certification reports do not go beyond this checklist, and the quality of the assessments has also been poor (Greenpeace 2009a). FOTS only has six certified certification bodies; three of these are ones also certified for MSC, and the other three are two from Italy and one from the UK.

The FOTS certification checklists include four (of eight total) areas that could potentially cover seabird issues. These are discussed separately, below:

- FOTS area #2, "Ecosystem impact criteria"
  In this area, effects of the fishery on the food web, upon which seabirds would depend, is covered, and that there is no fishing in protected areas.
- FOTS area #3, "Selectivity criteria"
  Species classified as IUCN red List VU (Vulnerable), EN (Endangered), or CR (Critically Endangered) must not be caught. This could include some seabirds.
- FOTS area #4, "Legal compliance criteria"
  Ensures that there is legal regulation and enforcement of those regulations.
- FOTS area #5, "Management"
  Ensures that there is adaptive management, proper reporting requirements, etc.

FOTS standards therefore are written in more general, broader terms than MSC's. This does not ensure that the fishery is sustainable with regard to seabird bycatch. Nowhere in the certification checklists is there any mention of seabirds specifically, and because there are no guidance documents supporting the checklists, there is no specific information on dealing with seabird bycatch issues. One significant advantage of the checklist approach FOTS uses for its certification over the MSC certification system, however, is that the checklist requires that the

certification address each point in the checklist; the certification body cannot just ignore an issue and skip over it.

The Friend of the Sea standards seem much more focused than MSC standards system on smaller fisheries and keeping the costs down for the assessment. FOTS pre-certification is carried out using only a simple checklist and form, and is free. Apparently, full assessments carried out for FOTS certification are also less expensive than those for MSC certification, probably because they require less time from the certification bodies. This lower cost can be important for many smaller, artisanal, or developing-country fisheries for which the cost of an MSC certification can be high and the financial gain from being certified is currently low.

There is also more focus by FOTS on the human element in the fishery (for example, fair wages) and on issues dealing with energy efficiency of the fishing fleet and waste management of the fleet and processor. The latter includes not just offal management but all wastes that might be produced, such as paper or plastic, engine oil, etc.

Because the standards are written generically with regard to bycatch and with no specific mention of seabirds, it is difficult to assure that the certification process would be sufficiently rigorous to ensure that any seabird issues are properly considered. In this, Friend of the Sea standards are very weak on seabird conservation issues, far weaker than the MSC standards. Seabird issues would only be considered and dealt with if the fishery takes it upon itself to address, or even to mention, any problem.

Naturland Wildfish

The Naturland organization certifies primarily agricultural products, with fisheries as a minor role. It is a German organization (Naturland - Verband für ökologischen Landbau e.V., or Naturland - Association for Organic Agriculture), and the majority of its certifications of all types are in Europe. Naturland also has a farmed-fish certification program, which is not addressed here.

Naturland Wildfish is a new certification, with standards only fully published in May 2011 (Naturland 2011), although the standards have existed for some time (the first version adopted in November 2006) in draft form and have been applied in that form. The certification is aimed at "sustainable capture fishery," equivalent to the MSC certification target. At present it is not clear that any fisheries have been certified under Naturland Wildfish, although several certifications are under way, and one or two are apparently close to certification, with the certification reports completed in 2011. These are three freshwater fisheries for Nile Perch in Bukoba, Mwanza, and Musoma, Tanzania, on Lake Victoria. Although the standards are written to cover marine fisheries as well as freshwater, to date there are apparently no marine fisheries in the program.

The Naturland Wildfish assessment standards and the guidance for those standards are far less detailed than are the MSC documents, and the standards generally cover the same issues as MSC. Naturland Wildfish standard, however, places a great emphasis on social responsibility for the human element in the fishery, requiring that all persons involved in the fishery (for example, fishers, processors, and transporters) receive a fair living wage, no child labor is used, workers

have safe conditions in which to work, workers have the right to free association and access to trade unions, and so forth. MSC has been criticized for its lack of emphasis on social responsibility issues (Greenpeace 2009b). In contrast to MSC certification, Naturland Wildfish specifically prohibits any use of genetically modified organisms (GMOs) and no use of nanomaterials, for example to modify characteristics such as color or texture.

Naturland Wildfish standards are written in more general, broader terms than MSC's, with many fewer details and little in the way of technical specifications. The Naturland Wildfish standard only generically covers issues that would relate to seabirds. For example, the standards state that the fishery must be operated in a manner to ensure "integrity of the ecosystem is maintained long-term, concerning both the stocks of the economically relevant species as well as the other components of the ecosystem," which would appear to include seabirds. The standards also require "avoidance or minimisation of bycatches." This, however, does not ensure that the fishery is sustainable with regard to the bycatch species; a minimized level of bycatch of a highly endangered species might nonetheless be unsustainable. Nowhere in the Naturland Wildfish standards is there any specific mention of seabirds or any birds. Bycatch of marine mammals and sea turtles is, however, specifically mentioned and is prohibited. Also nowhere mentioned is any requirement to address issues of threatened or protected species, seabirds or not.

The Naturland Wildfish standards seem much more focused on small-scale fisheries, and on the human element (wages, contamination of the food with GMOs) than on ecosystem sustainability. Because the standards are written so generically with regard to bycatch and with no specific mention of seabirds, it is difficult to assure that the certification process would be sufficiently rigorous to ensure that any seabird issues are thoroughly considered. The Naturland Wildfish standards are very weak on seabird conservation issues, far weaker than the MSC standards. Seabird issues would only be considered and dealt with if the fishery takes it upon itself to address, or even to mention, any problem.

KRAV Ekonomisk förening

Like Naturland, KRAV is an organization which primarily certifies many classes of agricultural products but which also has a sustainable fishery certification. KRAV is based in Sweden, and its fishery certifications focus on Scandinavian-run fisheries, although not all are in Scandinavian waters (for example, one fishery in assessment is a krill fishery in Antarctic waters). KRAV began its certification system in 2002.

The standards documents for fishery certification present on the KRAV web site (www.krav.se/KravsRegler/17/) are, like the Naturland Wildfish standards, written in more general, broader terms than MSC's, with many fewer details and little in the way of technical specifications. The KRAV standard only generically covers issues that would relate to seabirds. KRAV requires self-documentation by boat captains of every fishing trip (area fished, exact site where gear was set and hauled, type of gear used, etc.), and logbook recording of all seabird bycatch. KRAV does not require on-board observers. One unique feature of the KRAV standard, however, is that the review committee always has as one member a staff person from World Wildlife Fund.

Because they do not take seabirds specifically into account, the KRAV standards are very weak on seabird conservation issues, far weaker than the MSC standards. Although the standards might generically cover seabird issues, because there is no specific requirement to address seabirds, it would be very easy to skip or overlook seabird issues. Having a representative of a conservation organization on the review committee, however, is a strength of the system.

Marine Eco-Label Japan

The Marine Eco-Label Japan (MEL-J) was established in late 2007, and is aimed primarily at Japanese fisheries. The label is owned by the Japanese government. It appears that the number of fisheries certified by MEL-J is quite small, perhaps three or four. One of the objectives of the certification system is to reinforce cooperation between the fishers and scientists, to assure that high-quality information is used to manage the fishery.

Because very little of the information available on MEL-J is in English, I cannot conduct a complete review of the MEL-J standards. However, the Accenture Development Partners (2009) analysis gave the MEL-J a low score on how it evaluates effects of the fishery on the ecosystem, which is the component that would include seabirds. The analysis gave MEL-J a low overall score.

Responsible Fishing Scheme

The Responsible Fishing Scheme (RFS) is not an ecolabel, but rather an effort to improve the fishing industry. It operates at a per-boat level, not per fishery, and is targeted at boats based in the UK.

The RFS does include as requirements some issues that could relate to seabird impacts. It requires that bycatch, including specifically seabirds, must be minimized. However, as with the Naturland Wildfish certification, this does not ensure that the fishery is sustainable with regard to the bycatch species, because a minimized level of bycatch of a highly endangered species might nonetheless be non-sustainable. Beyond this, however, RFS standards make no mention of seabirds. The standards are so weak with regards to seabird, and indeed, to most environmental issues, that the RFS probably should not be considered a sustainable fishing certification.

Dolphin-Safe / Agreement on the International Dolphin Conservation Program

The countries signatory to the Inter-American Tropical Tuna Commission (IATTC), which is responsible for management of tuna in the eastern Pacific, established the Dolphin-Safe label in 1999 as part of the Agreement to the International Dolphin Conservation Program (AIDCP). The standards are legally binding on all of the signatory countries.

Although the Dolphin Safe / AIDCP standards are obviously aimed at dolphin conservation, the standards do include a component of reducing all bycatch, which would include seabirds. The

Accenture Development Partners (2009) analysis gave the Dolphin Safe / AIDCP a low score on how it evaluates effects of the fishery on the ecosystem, which is the component that would include seabirds. The analysis also gave the Dolphin-Safe / AIDCP a low overall score.

HOW CAN MSC BE STRENGTHENED?

Although the MSC certification system is in general strong and effective with regard to seabird bycatch, of course any system can be improved. One significant place where improvements could be made is in certification reports. At present, each certifying body produces certification reports in its own format, and the format of those reports often changes over time and by author of the report. For the reader, then, it can be difficult to compare fisheries, or to understand all of the implications of a fishery. Therefore, MSC could improve the reporting by enforcing a specific format on reports, at least with regards to which sections are included, and in some cases how information is reported.

In addition, as discussed above on page 13, without a specific report format requiring specific headings, a report can ignore or omit discussion of significant topics. Although there is no suggestion that any reports have intentionally ignored important issues that might relate to the sustainability of a fishery, in some reports it is difficult to tell whether an issue was considered and determined to be not significant, because the report does not mention or discuss the issue in any way. If reports were put in a standardized format requiring headings for all issues, it would become clear how all issues were treated. If an issue were determined to be not significant, for example, seabird bycatch in a hand-raked clam fishery, the report would then state "there is no known seabird bycatch." At present, in such a situation, too many reports simply do not mention or discuss seabird bycatch.

A good example of how the information on seabirds and seabird bycatch can be presented is in section 7.3.6 (page 32) of the Public Certification Report for the Portuguese Sardine Purse Seine Fishery, which was MSC certified in January 2010. This section gives species lists, threat levels, distribution, and discusses studies of the birds and bycatch. In general, that report is a good example, although it still does not mention or describe any mitigation methods used. The Draft Public Certification Report for the New Zealand Southern Blue Whiting Trawl Fisheries, in section 7.3 on page 46, provides a very good example of the description of mitigation methods used for reducing seabird interactions and bycatch, and the status of the use of those methods. The Grupo Regal Spain Hake Longline Fishery Public Draft Certification Report serves as a good example of both the description of the fishing gear used (beginning on page 7) and of the methods used for avoiding seabird bycatch (beginning page 5).

Therefore, to the goal of making all MSC reports more readily understandable and data gaps more visible, MSC should require that all issues that are common to all fisheries be addressed in the certification reports so the assessors cannot just skip over the issue, leaving the reader to wonder if there is, for example, seabird bycatch and it is just not reported, or if there is actually no seabird bycatch. Some examples of what should always be included in the reports are:

- List and describe all gears being used in the fishery.

- List any and all mitigation methods that are used with those gears. Mitigation methods are rarely listed and described; this should be explicit. If no mitigation methods are used, that should also be explicit.
- Provide the harvest tonnage of target species by gear type, so the relative importance of each gear type to the fishery could be evaluated.
- Have individual sections within the non-target bycatch sections (all of Principle 2 components) that discuss:
    - Seabird bycatch. If "none" this should be explicitly stated and a citation given.
    - Sea mammal bycatch. If "none" this should be explicitly stated and a citation given.
    - Sea turtle bycatch. If "none" this should be explicitly stated and a citation given.
- Give information on observer coverage in a standardized format, showing proportion of voyages and sets observed, types of information observed (e.g. whether only target species are monitored or whether all details including non-fatal non-target interactions are included), what type of observer (industry-supported or independent), observation techniques (on-board or on-landing, video), qualifications or training programs required, are observer data given actually obtained for the fishery being certified or only for a related or similar fishery, etc., and show how this has varied over seasons and years.

Besides making the reports more clear, this could assure that these issues are addressed by the assessors. Another way to assure that no issues are skipped would be to have an MSC-standard checklist similar to that used for Friend of the Sea certifications. This checklist could be less detailed than that required by FOTS, because it would not supplant the MSC assessment tree, but would only provide a quick overview of whether all issues relating to the fishery had been addressed. The checklist should have seabirds as one item (as well as sea mammals, etc.), so that the certification body would make explicit its treatment of the issues, even in the negative.

These improvements in reporting on certifications do not have a direct effect on improving seabird bycatch (and other) issues, but would allow reviewers to more quickly review and understand the implications of certification of a fishery. However, these improvements are not sufficient. Outside reviewers provide a check on MSC certifications, and therefore outside reviewers must have the opportunity to review the documents and make comments or raise objections. To allow this, the reviewers must have sufficient time and must be aware of what is happening with certifications before the certification is issued by MSC.

To assist outside reviewers, therefore, MSC must make sufficient time available. At present, Public Draft Certification Reports are opened for review for as little as one month. A significant improvement would be to double this time period, to give reviewers who may not have sufficient resources to work on reviewing MSC documents on a full-time basis a greater opportunity to review the report.

In contrast to these improvements in reporting and reviewing, one important issue that has direct impact on seabird conservation is that many fisheries are being certified as sustainable with known seabird bycatch, but with inadequate information on the size and implications of that bycatch. As can be seen by the list of conditions placed on fisheries on page 18 and the discussion of those conditions on page 26, a significant number of fisheries are being certified

with the condition that they obtain or improve information on seabird interactions and bycatch. In many of these cases it is not clear that the fishery is sustainable with regard to seabird bycatch. Although the conditions placed on the fisheries probably would over time, ensure that they are sustainable, fisheries could be certified that are not sustainable at the time they are certified, only because the information is not there. MSC should not allow fisheries to be certified for which there is a reasonable suspicion of unsustainability, but for which information is not available.

To rectify this problem, MSC should require that information gaps with suspicion that a fishery might be unsustainable should be filled before the fishery is certified, and not allow that fishery to be certified but with a condition placed to fill the information gap in the future. How can one tell if a fishery has a significant information gap and might be unsustainable? Outside commenters on Public Draft Certification Reports usually identify such fisheries.

Recommendations

- Do not allow fisheries to be certified as sustainable if there is an information gap, for example in bycatch, and there is a reasonable suspicion that the fishery might not be sustainable on that issue.
- No report should ever be able to be written that doesn't mention "bird" or any other ETP species that occurs in the area.
- Establish standards for certification reports, with requirements to:
    - Require that all issues be addressed explicitly. This would require a more standardized report format, with headings for each issue, such as seabird bycatch. If no seabird bycatch is known, the section could read "none known," but this would make the information explicit. One improvement might also be to perhaps use a checklist similar to those used by Friend of the Sea.
    - List and describe all mitigation methods being used.
    - Give proportion of target species catch that is landed using each type of gear in use in the fishery.
    - List all species of ETP seabirds (as well as ETP sea mammals, sea turtles, or other marine life such as corals) that occur in the fishery area.
    - List all species of seabirds that are significant bycatch.
    - Require reporting of seabird bycatch and interactions in a standardized quantitative manner.
    - Standardize the language and format of reporting observer coverage, so that observer coverage can be readily ascertained.
- Increase the amount of time between issuance of the Public Comment Draft Report and the final Public Certification Report by at least one month, to a minimum of two months.

CONCLUSION

MSC certification does benefit seabird conservation. There is little evidence that MSC certified fisheries have significant seabird mortality and bycatch issues, with only a few exceptions. A remaining concern is the fairly large number of fisheries for which filling information gaps on bycatch is a condition of certification, meaning that the certification was given without full

information. However, even there, most of those fisheries with information gaps probably do not have unsustainable seabird bycatch problems.

The impact of MSC certification on seabird conservation is somewhat limited, because few of the fisheries that have high seabird bycatch are likely ever to apply and invest the significant sums required for assessment, only to be turned down. These fisheries, therefore, remain beyond the reach of MSC. However, MSC may be having a greater impact on fisheries before they enter the certification process. Because the cost of certification is high, most fisheries interested in certification undergo the less-formal pre-certification process. In pre-certification the issues needing improvement may be addressed before entering the certification process.

As long as MSC certification is only a small fraction of all fish consumed, it places little pressure on the high-risk, high-seabird-mortality fisheries to even consider becoming certified. Only when enough of a market is certified (so that being certified provides a greater income through higher prices or provides access to a market that those not certified have no access to) that there becomes an incentive to be a part of the certified group will there be any pressure from the high seabird bycatch fisheries to try for certification, thereby having the certification process have effect on seabird conservation.

One of the problems of the MSC fishery certification process is that it relies on undocumented and undocumentable expert opinion. Even when the experts are knowledgeable in the various aspects of the fishery, different experts may interpret the same data differently, or place different importance on different aspects. In other words, an MSC certification is a subjective result. This is an inherent feature of such systems, and it is probably not solvable.

REFERENCES

Accenture Development Partners. 2009. Assessment study of on-pack, wild-capture seafood sustainability certification programmes and seafood ecolabels. WWF International, Gland Switzerland.

Agnew, D., C. Grieve, P. Orr, G. Parkes, and N. Barker. 4 May 2006. Environmental benefits resulting from certification against MSC's Principles & Criteria for Sustainable Fishing. Final report for Phase 1 of 2 to create a system of tracking environmental benefits of certification against MSC's Principles & Criteria for Sustainable Fishing. 134 pp.

American Bird Conservancy. 2011. Methodology to Assess Fisheries for Risk to Seabirds, 15 December 2011. Unpublished report, American Bird Conservancy, The Plains, Virginia, USA.

American Bird Conservancy. 2012. In-Depth Analyses of Seabird Bycatch in Individual Fisheries. Unpublished report, American Bird Conservancy, The Plains, Virginia, USA.

Cambridge, T., S. Martin, F. Nimmo, C. Grieve, S. Walmsley, T. Huntington, R. Cappell, and D. Agnew. 2011. Researching the environmental impacts of the MSC certification programme, 2011. Unpublished report to Marine Stewardship Council, 143 pp.

Greenpeace. 2009a. Assessment of the Friend of the Sea Fisheries and aquaculture certification Programme. Pp. 1-7.

Greenpeace. 2009b. Assessment of the Marine Stewardship Council (MSC) Fisheries Certification Programme. Pp. 1-10

Hauselmann, P. 2009. Methodology to assess fisheries and aquaculture certification schemes, version 6. Greenpeace International, Amsterdam.

IUCN 2011. IUCN Red List of Threatened Species. Version 2011.2. www.iucnredlist.org. Downloaded on 08 February 2012.

Marine Stewardship Council. 2010a. Fisheries Assessment Methodology and Guidance to Certification Bodies, including Default Assessment Tree and Risk-Based Framework. Version 2.1, Release date: 1 May 2010.

Marine Stewardship Council. 2010b. MSC Fishery Standard: Principles and Criteria for Sustainable Fishing, Version 1.1 – 1st May 2010.

Marine Stewardship Council. 2011. Guidance to the MSC Certification Requirements. Version 1.0, August 15 2011.

National Marine Fisheries Service. 2011. Fisheries of the United States 2010. 101 pp.

Naturland. 2011. Naturland standards for sustainable capture fishery, 05/2011. Naturland, Gräfelfing, Germany. 14 pp.

Zydelis, R., J. Bellebaum, H. Österblom, M. Vetemaa, B. Schirmeister, A. Stipniece, M. Dagys, M. van Eerden, and S. Garthe. 2009. Bycatch in gillnet fisheries – An overlooked threat to water bird populations. Biological Conservation 142: 1269–1281.

ACRONYMS USED IN THIS DOCUMENT

ABC	American Bird Conservancy
AIDCP	Agreement to the International Dolphin Conservation Program
CCAMLR	Convention for the Conservation of Antarctic Marine Living Resources
ETP	Endangered, threatened and protected; refers to species
FOTS	Friend of the Sea
IATTC	Inter-American Tropical Tuna Commission
IUCN	International Union for Conservation of Nature
KRAV	The Swedish Organic Agriculture Association
MEL-J	Marine Eco-Label Japan
MSC	Marine Stewardship Council
NGO	Non-governmental organization
RFBPS	Royal Forest and Bird Protection Society of New Zealand
RFS	Responsible Fishing Scheme